

## Fossilized Remains of Giant Sea Predator Found in the Breaks

*Story and photos by  
Craig Flentie  
Central Montana District*

It was another hot, still day in the Missouri Breaks--the kind of July day that makes the cattle and wild things lay-up in the shade and wait for the cool of evening before moving about much. About the only things moving across the landscape during the heat of this day was a rolling blanket of grasshoppers and two BLMers.

Jacob Greenwood and Katelyn Miller (summer seasonals on the Lewistown Field Office range staff) had parked their BLM pickup and hiked about a half mile into a remote coulee to complete a regularly scheduled monitoring/condition check on a BLM livestock reservoir.

Aside from a little saline seep above the reservoir and slightly brackish water (both fairly common conditions in this country this time of year) the reservoir was in good shape. On their way out, Greenwood and Miller changed their route and walked north through a different coulee to reach the ridge that would take them back toward the vehicle.

They had nearly reached the ridge top when they noticed a cluster of rock-like objects exposed on an open, shale hillside that looked somehow out of place. Closer examination revealed a cluster of fossilized bones--some about the size of a lemon, others as large as a grapefruit. Some of the pieces were clearly identifiable as portions of a ball joint, vertebrae, and a variety of other bone segments.

Neither Greenwood nor Miller was entirely sure what they had found. However, they both recognized it was a unique moment as they were looking at a particular set of fossil remains (65 million years old or older) that in all probability no human had previously seen.

Jacob and Katelyn took a GPS reading to mark the location and collected some of the larger, exposed pieces.

Back in Lewistown, Greenwood and Miller reported the find and gave the collected pieces to Zane Fulbright, an archaeologist in the Lewistown Field Office. While paleontology is not exactly Fulbright's forte, Zane has a long list of professional contacts and knew where to turn for answers.

### Team Rogers

Zane contacted Ray and Kristi Rogers, who happened to be in Lewistown this summer, about viewing the collected pieces and possibly helping with a site visit to identify the creature Jacob and Katelyn found.

Ray and Kristi are somewhat unique characters to find kicking around a coffee shop in Lewistown, Mont.

Ray Rogers holds a Ph.D. in geology from the University of Montana and is a professor and chair of the geology department at Macalester College in Saint Paul, Minn. Kristi Rogers holds a Ph.D. in biology and is an assistant professor

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Jacob Greenwood begins piecing together fossilized bones at the discovery site.

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# Fall is a great time to visit public lands

If you ask me, it doesn't seem like we should be in the middle of hunting season already. Didn't summer just start a few weeks ago? But the calendar tells me that the time is here. So, on behalf of the Montana/Dakotas BLM, I would like to welcome all of you to your National System of Public Lands this fall.

More of you visit BLM-managed public lands during the fall season than at any other time of the year. You use the public lands to hunt, camp, boat, fish, float, or simply to take a drive through the countryside. While nonresidents may have to travel a considerable distance to enjoy the western quality of life and open spaces our public lands provide, others of us are fortunate enough to have these opportunities just a short drive out our back door.

Whatever the distance travelled, public land users make a huge economic contribution to our gateway communities and states as you buy gas, hunting and fishing licenses, clothing, motel rooms, steaks, souvenirs, anything made of huckleberries, and many other items to help complete your trip. Some of you will employ outfitters or shuttle services during your activities. Last year, BLM-managed public lands throughout the West generated 58 million recreational visits. These visits created billions of dollars in spending which then circulated through our local, state, and national economies.



Smokey says: "Be fire-wise in the field! Check your undercarriage for flammable debris!" Photo by Mark E. Jacobsen



Montana/Dakotas BLM  
State Director Jamie E. Connell

We are pleased that public lands serve as a stage for this kind of recreational and economic activity. The BLM's multiple-use approach to managing your public lands ensures the widest possible array of appropriate uses for the widest variety of users, while conserving our public resources.

But you also play a big part in the stewardship of the public lands. Remember to never leave a campfire until it's dead out, be aware of and abide by any fire restrictions, drive only on established/open roads, use good land status and block management maps (to know where you are), respect other recreationists, and always respect private property.

Please don't hesitate to stop by any BLM or any other federal or state land-managing agency office for information. Any of us will be glad to answer your questions.

Enjoy your public lands; they're an important part of the quality of life so many of us enjoy.

A handwritten signature in cursive script that reads 'Jamie E. Connell'.

Jamie E. Connell  
State Director



It did not take long for Ray Rogers to identify the fossils as those of a plesiosaur.

*Continued from page 1*

of biology and geology at Macalester College.

They are well known in the scientific community for their paleontological research and have worked in seemingly exotic sites scattered from Antarctica to Madagascar. Ray is currently on a one-year sabbatical from Macalester College. Ray and Kristi recently purchased a house in Lewistown because of its proximity to the Missouri Breaks, an area they feel is a treasure trove of fossilized information about micro-invertebrates and other life forms of prehistoric days.

Their passion for paleontological research first brought them to Montana in the early 1990s and they have made it a point to return every summer since then to continue their quest. Their drive is not to find museum display pieces, but to continue searching for answers to the web of questions that connect prehistoric life to present life.

The Rogers' research is designed to answer questions about how a particular set of fossils formed in a certain set of rocks; whether the fossilized creature was from the local area or was moved here by water, glacier or time; whether or not dinosaurs migrated across the Breaks; how do previous extinctions relate to today's increased stress and climate change; and is the rate of extinction increasing?

Answering these connecting questions in the fossil record can help mankind

understand where life has been and perhaps where life is going.

Ray and Kristi conduct their research under the administrative umbrella of a permit agreement between the BLM and Macalester College. They bring undergraduate geology students to the Missouri River Breaks every year for field school opportunities and many of them have published papers based on their research in the Breaks. In 2010, the BLM formalized this relationship by establishing a Challenge Cost Share agreement with

Macalester College with the goal of developing interpretive and educational material for Monument visitors and staff.

Late in August, Ray and Kristi had a chance to examine the collected fossils in the Lewistown Field Office. Then Ray accompanied Zane, Jacob, and Katelyn back to the site to confirm the identity of the creature buried in this remote coulee in the Breaks.

The ride to the site took much longer than the identification process. After excavating a few buried fossils and vacuuming the surface for additional remains, Ray quickly identified the fossilized remains as those of a plesiosaur, similar to the find recently excavated on the Charles M. Russell National Wildlife Refuge.

### **Plesiosaur**

The fossil record has yielded enough information to help scientists piece together a pretty good understanding of the plesiosaur.

The plesiosaur family occupied the top of the water-based food chain in the seas that covered much of the world and Montana 300 – 150 million years ago.

If other creatures of the prehistoric day could reason, they recognized the plesiosaur as sea dwelling predator that cast a long shadow of fear wherever it swam.

A plesiosaur could grow to over 50 feet long and weigh over 12 tons. It had a long slender neck, a relatively small head, teeth and jaws designed for killing,

and four fins on the lower side of its bulky body to propel itself.

They were opportunistic hunters/killers that killed with brute force; finesse was not in their tool box. Scientists believe a plesiosaur would bite into a victim of the moment with a powerfully built jaw, then thrash about until they started tearing chunks off of their unfortunate victim. Their hunting/feeding technique has been deemed a real blood bath that could make a T. rex feel queasy.

### **Significance of this Find**

This particular find probably is not complete enough to be of museum display quality, but that's not the emphasis of this field of research.

Ray Rogers has since contacted several of his scientific peers and they all agree that this find has the potential to provide information that could help unravel the web of questions surrounding the link between prehistoric life and present life. The remains definitely have value for educational purposes and countertop displays for public enjoyment.



Katelyn Miller holds two intact vertebrae from a plesiosaur.

Time will tell what this find may provide. It appears that next field season Team Rogers, several of their peers and students and perhaps a graduate student or two from the University of Alaska-Fairbanks will be trekking back into this lonely ridge to excavate the remains of this plesiosaur.

Research, discovery, and learning are often very structured processes, but on occasion they're as random as taking a different route back to the truck.

# Prescription for a healthy forest

*David Abrams*  
*Western Montana District*

The heat-resistant cameras were set up. The helicopters with the helitorches were on standby. The firefighters were suited up and ready to go. All that remained was selecting a favorable window of weather and fuel conditions—not an easy thing to do during this wetter-than-normal summer in the Rocky Mountains.

But on June 28, the Missoula Field Office got the right weather window and fire managers converged on the Garnet Mountains east of Missoula for a successful controlled fire treatment.

Steve Hancock, a fire management specialist with the Missoula Field Office, explained the 200-acre burn project was designed to move the vegetation in the area towards historic conditions “by altering species composition and structure and to restore the natural fire regime processes that the forest has evolved with.” All of this area has burned naturally in the past, each time maintaining natural meadows and openings across the landscape. The intent of the burn was to mimic those natural patterns. The prescription was for a mixed severity, or “stand replacement” fire, where much of the overstory vegetation would be removed.

One objective of the controlled burn was to restore a high-elevation meadow that had been overgrown by lodgepole pine and Douglas-fir trees. Among other things, the meadow restoration would improve the summer and autumn ranges of elk and deer. The Rocky Mountain Elk Foundation contributed to the project, just as it has in many of the vegetation management projects the BLM Missoula Field Office conducts.

The controlled burn also created a ridge-top fuel break which will

help decrease the probability of large-scale, high-severity wildfire, Hancock said, adding, “The ridge-top fuel break is primarily intended to protect the adjacent Wales Creek Wilderness Study Area. It is also intended to protect public and private lands around the Wilderness Study Area in the event of a wildfire becoming established inside the Wales Creek drainage. This is especially important in this area,”

Hancock noted, “because there’s an abundance of dead and dying trees due

to the large-scale pine beetle epidemic which has been prevalent across Western Montana over the past several years.”

Fire managers often attempt to mimic natural disturbance patterns by arranging treatment areas in patches relative to the size in which they naturally occurred. To do this, managers analyze historical photographs. In this case, aerial photos



Murray Douglas unit F10 during ignition.  
*BLM photo*

from the 1930s were compared to recent aerial photos of the area to determine the size and location of where the vegetation treatment would be conducted.

The controlled burn didn’t just improve the condition of the forest—it also contributed to science by allowing researchers to get an up-close and personal look inside the flames. The USDA Forest Service Rocky Mountain Research Station-Missoula Fire Lab set up cameras and sensors that were able to withstand extremely high temperatures. The footage and data captured and the experiments conducted will help to better understand the dynamics involved in fire behavior and how they correlate to heat, combustion, and fire spread.

On the day of the controlled burn, a helicopter with a device called a “helitorch” was used to ignite selected areas of the project. Firefighters and fire engines from the BLM Western Montana District, Lolo National Forest, Beaverhead-Deerlodge National Forest, Helena National Forest, and the Missoula Smokejumpers were on the ground to mop-up and patrol the burn. Ignition lasted for two hours and the fire burned for another hour after ignition was completed. Just as the flames were starting to die down, the area received significant rainfall which helped keep the controlled burn within its intended boundaries. Prior to ignition of the burn, fire managers were aware that precipitation was likely in the afternoon due to weather forecasts issued earlier in the day.



USFS Missoula Fire Lab Analyst Karin Riley observes the controlled burn from an observation point on Elevation Mountain.  
*BLM photo*

Firefighters continued to mop up and patrol the project for several days to ensure the burn was secure. Fire managers utilized a thermal imaging camera operated from a helicopter in order to detect residual heat that could surface in the future as the summer turned warmer and drier. Fire managers continued to monitor the prescribed fire throughout the summer.

“As is the case with many controlled burn operations, there were many challenges involved in the successful completion of this project,” Hancock said. One major challenge was the abundance of dead and dying lodgepole pine trees in the area. “This created a highly volatile environment, typically difficult to conduct a controlled burn in,” he said. “Fuels inside the burn unit were mechanically arranged in a particular way to account for this, and the ignition pattern was conducted in a controlled manner.”

However, the abnormally cool and wet spring led to ideal burning conditions, as the above average snow pack and late run off created wet fuel conditions in the areas outside of the controlled burn, thus minimizing fire behavior outside of the unit. The south facing aspect of the controlled burn enabled the fuels inside of the unit to dry out much faster, resulting in much more intense fire behavior. Flames as high as 150 feet consumed the canopy, opening up meadows for deer and elk to use in the future.

“This was a significant and successful vegetation management project for our office, one which required not only a lot of hard work by our natural resource specialists, but also our cooperators from the USDA Forest Service,” Hancock said.

For more information about this project and the BLM Missoula Field Office Fuels Program, please contact Michael Albritton or Steve Hancock at (406) 329-3914.

## BLM Supports FireSafe Montana

Mary Apple  
Montana State Office

The Montana/Dakotas BLM recently added \$50,000 to FireSafe Montana's fire prevention efforts. The money will be used to mobilize Montanans to make their homes, neighborhoods, and communities fire safe. The BLM is a major sponsor of Firesafe Councils in Montana and South Dakota. In a recent news release, Montana FireSafe Executive Director Jenny Mayberry wrote:

*Preparing for wildfire is not a onetime effort before the fire season but requires the work and cooperation of many throughout the year. FireSafe Montana thanks the Bureau of Land Management's community assistance program for its continued generosity in promoting citizens helping citizens through local councils across the state. Currently, there are 12 active councils and a number of communities in the process of forming local councils. By forming FireSafe Councils, communities protect their homes more effectively by collaborating on their individual fire preparedness efforts.*

FireSafe Councils throughout Montana are devoting time and energy in their community to increase the chance their homes will survive a fire. Although preparing for a wildfire is the individual homeowner's responsibility, there is a vast network of support among local FireSafe Councils, FireSafe Montana, and cooperating entities to ensure that homeowners have the tools they need.

FireSafe Councils started in California and Nevada to educate homeowners about the threat of wildland fires. Montana's FireSafe Council was the third council formed. There are now 20 local FireSafe Councils throughout Montana with several more in the start-up phase.

FireSafe Montana has produced several educational products for homeowners and works with state and local elected officials to help mitigate and/or reduce wildfire threats in the wildland/urban interface.

For more information, visit the FireSafe Montana website: <http://www.firesafemt.org/index.aspx>.



FireSafe Montana Executive Director Jenny Mayberry and BLM Mitigation and Education Specialist Terina Mullen (Western Montana District) are pictured at FireSafe's booth at the Montana State Fair. BLM recently donated \$50,000 to FireSafe Montana.

# Intensive Program Bridges the Divide

Ann Boucher  
Montana State Office



*It was an unusually long and cold winter. The hunters could not find any game, and the food stores of the village were just about gone. The old woman left her lodge and went out in the cold winter to ask the creator to help her people. As she sat down praying in the crisp air, tears streamed down her face. Teardrops flowed through her long straggly gray tresses, dropping onto the snow-covered ground. In answer to her prayers, the tears turned into bright pink flowers as the creator gave bitterroot to the Salish people.*

Long before explorers Lewis and Clark wrote about the beautiful purplish-pink flower of the bitterroot, Native Americans were using its roots for food and trade. Both the Salish and Shoshone-Bannock peoples dug the roots in the early spring and dried quantities of it for storage and use during the winter months. The root was too bitter to eat unless it was cooked, and it was usually mixed with berries or meat. The bitterroot plant (*Lewisia rediviva*) grows on gravelly to heavy, usually dry, soil in scablands or foothills areas. It is found on sagebrush covered plains and lower mountain slopes, in western and south central Montana.

In a world of instant news feeds, rapidly advancing scientific research, and an overwhelming array of entertainment, it's easy to lose touch with the quieter, more traditional ways and wisdom. But those traditions have a lot to offer. The question is, how do we integrate them into our fast-paced world?

The Bridging the Divide Program is one attempt to mesh modern science with Native tradition. Now in its second year,

BTDD brings together Native American youth and tribal elders, incorporating time-honored knowledge with modern ecology while acquainting students with careers in cultural and natural resource management.

Designed as a summer school course for tribal high school students, the BTDD program examines landscapes and ecosystems in the context of both modern science and cultural tradition. Five weeks of classroom learning at Shoshone-Bannock Junior/Senior High School in Fort Hall, Idaho, are followed by a one-week camp at Birch Creek Outdoor Education Center near Dillon, Mont. Instructors include high school teachers, tribal elders, and BLM and U.S. Forest Service specialists.



Jacie B. and Marcia C. clean bitterroot.  
BLM photo

BTDD uses a four-part curriculum. One part explains scientific ideas in the context of ancient stories. Another one ties landscapes to the history and cultural identity of Native Peoples. A third segment explores how fire has been used through history to create a diverse mosaic of habitats, and how current land managers continue to use it today. The fourth component examines ethnobotany, the study of how plants are part of the culture.

Organizers emphasize different landscapes and individual plants each year, giving

students both a broad overview and a detailed study in some aspect of their ancestors' lives. This year's focus was on sagebrush steppe ecosystem and the bitterroot. While learning about the overall ecology of the ecosystem, students learned about and practiced skills used by previous generations to harvest, store and prepare the roots of the bitterroot, a critical source of food. Next year's emphasis will be on riparian areas and the red willow, an age-old building material, and the cutthroat trout.



Students learn how fire scars are used to reconstruct fire history from Brian Anderson of the Beaverhead-Deerlodge National Forest. BLM photo

"Learning traditional skills was perhaps the biggest hit of the camp," said BLM Tribal Coordinator Mark Sant, "but they also particularly enjoyed how the curriculum integrated modern ecology with traditional life-ways."

Sant came up with the idea for the field camp while working for the Beaverhead-Deerlodge National Forest. Interest and participation in the program is growing. At this year's camp held June 19-25, four tribal elders from the Shoshone-Bannock Tribe of Fort Hall and the Confederated Salish-Kootenai Tribe from Flathead led the group in traditional skills, while BLM and U.S. Forest Service employees addressed possible careers in cultural and natural resource management. Many of last year's students returned in 2011, and prepared a presentation of their own to promote the program at the annual Bannock gathering held in Ft. Hall on August 8-9.

The program is jointly funded by the BLM and U.S. Forest Service. Sant hopes to secure additional funding to continue the camp at Dillon and establish additional camps in other field offices.

For more information, contact Mark Sant at 406-896-5263.

# Black Hills Ultramarathon an Exercise in Endurance

*Story and photo by  
Ryan Phillips and Kim (Phillips) Hamil  
South Dakota Field Office*

On June 25-26, 152 runners from 30 states and three countries got to experience the BLM and surrounding lands in an up close and personal manner as they competed in the inaugural Black Hills 100 ultramarathon.

The race was run almost exclusively on the Centennial Trail, a portion of which runs through the South Dakota Field Office's Fort Meade Recreation Area (the first and last 5 miles of the event).

The Black Hills 100 is the second ultramarathon in the Black Hills, joining its sister race, the Lean Horse 100. Race organizers and participants didn't know what to expect. Race directing team members Jerry Dunn, Ryan Phillips, and Chris Stores recognized the potential of the Centennial Trail -- a 111 mile ribbon of single track-- as a more difficult counterpart to the Lean Horse, which is held on the relatively gentle, smooth and wide Mickelson Trail.

The group soon found out that the Black Hills are deceiving. The fact that they are located in South Dakota, which many people consider flat and featureless, and that they are called "hills" and not "mountains," did not make for an easy course.

Included in the festivities for the Black Hills 100 were 50-mile and 100K races. All three events began and ended on the Woodle Field track in Sturgis. All races followed the city bike path for just over a mile --the only paved portion of the course-- before reaching the Centennial Trail at the Fort Meade trailhead. From there, the event was purely on the Centennial, which runs south from the edge of the prairie to the heart of the Black Hills.

In true South Dakota form, the June weather provided some surprises of its own. On the night of June 25, the Black Hills 100 was hammered by an August-like storm which blew through the northern Black Hills over the course of a few hours, drenching the course with torrential rains, marble-sized hail, and heavy lightning. The temperature dropped as much as 45 degrees in less than 15 minutes, making an already difficult course even more challenging.

The combination of the challenging course and severe weather took a toll on the 100-mile race runners with a finish rate of only 30 percent (91 starters, 30 finishers). The national average for this type of race is 70-80 percent. Both the male and female champions of the 100-mile were

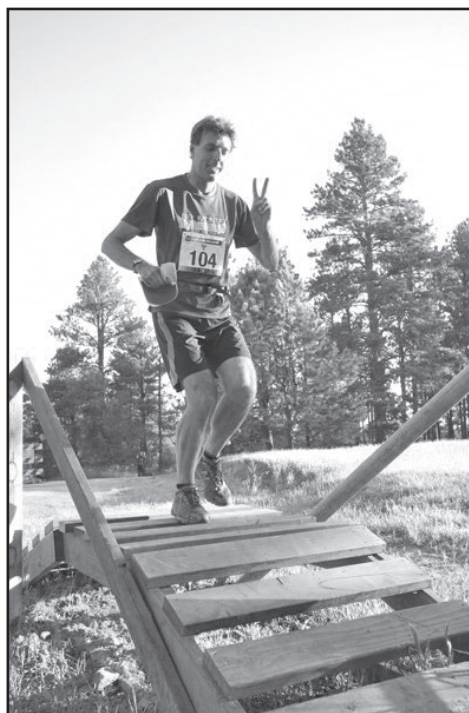
presented with authentic hand-painted buffalo skulls to commemorate their achievement.

The most common comment heard from competitors was "...that was way tougher than I thought it would be." Many compared it to other 100-mile ultra marathons, some of which are famous in the running community for their challenges.

Only time will tell how much of the challenge can be attributed to the weather, but the course certainly played a large role. One thing is for certain -- many came away with an appreciation for the unique beauty of the region and a well-developed sense of the challenges the Black Hills terrain can pose.

BLM Natural Resource Specialist Bill Monahan watched the race at the Alkali Creek trailhead. His assessment was brief and to the point.

"I guess the event is fun for the participants," he said. "But it's more comfortable to just watch."



A variety of skill levels was evident at the Black Hills 100 Marathon held June 25-26 in South Dakota. The course followed the Centennial Trail which spanned BLM lands in the Fort Meade area. Runners persevered in spite of stormy weather.

## Attention BLM Retirees

### The BLM Retirees Association

Stay in touch! The BLM Retirees Association has a social gathering at 11:30 a.m. on the first Tuesday of even-numbered months at the Windmill (3429 TransTech Way) in Billings. If you would like to receive email or postcard notifications of these meetings, please contact Alice Slagowski at 406-259-9319 or [asluggo@bresnan.net](mailto:asluggo@bresnan.net).

### The Public Lands Foundation

The Public Lands Foundation (PLF) offers new retirees a free one-year membership. If you're interested, contact one of the Montana PLF representatives: David Mari at 406-538-7121 or [dmari@earthlink.net](mailto:dmari@earthlink.net); or Kemp Conn at 406-360-9252 or [montanakconn@wildblue.net](mailto:montanakconn@wildblue.net) (please note "PLF" on the subject line).

What is the PLF? It works to keep America's public lands in public hands, managed professionally and sustainably for responsible common use and enjoyment.

The goals of the PLF are to:

- Keep lands managed by the BLM in public ownership and open to use by the public.
- Support multiple use management under the Federal Land Policy and Management Act.
- Encourage professionalism by BLM employees.
- Increase the public's understanding of and support for the proper management of the public lands.

Although PLF membership consists largely of retired BLMers, current employees and anyone interested in the goals of the organization are welcome to join.

### Retired since May 31, 2011:

Richard Herman -- 33 years  
Civil Engineering Technician  
Eastern Montana/Dakotas District

Randy Thomas -- 38 years  
Fire Management Officer  
Montana State Office

Connie Kolling -- 32 years  
Land Law Examiner  
North Dakota Field Office

Karilynn Volk -- 24 years  
Safety & Occ. Health Specialist  
Montana State Office

Richard G. Ekworthel -- 30 years  
Engineering Equipment Operator  
Billings Field Office

Gary L. Berg -- 38 years  
Minerals Resource Specialist  
Miles City Field Office

Glenwood F. Kerestes -- 29 years  
Mining Engineer  
Montana State Office

Bureau of Land Management  
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<http://www.blm.gov/mt/st/en.html>

The Quarterly Steward is published every three months by the Bureau of Land Management and distributed in Montana and the Dakotas. It is produced by the Office of Communications, Montana State Office.

Ann Boucher, Editor & Graphic Design

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